

HIGH POWER X-BAND FAST FERROELECTRIC SWITCH*

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The initial tests of an active high-power X-band microwave switch¹ are planned. The switch is designed to be the key element of either a Resonant Delay Line Pulse Compression System or a Delay Line Distribution System. The device works at a frequency of 11.4 GHz and is designed to handle peak power levels of up to ~500 MW. It employs ultra-fast, electrically-controlled ferroelectric elements that are fabricated from the recently developed BST (M), ver. 3 ceramic², whose intrinsic response time is ~10–30 nsec.

In the tests, the switch will be part of an active pulse compressor fed by ~10 MW pulses provided by the X-band Magnicon operated at NRL. The pulse compressor is designed to deliver a power gain of ~10, and thus should be capable of generating up to 100 MW at its output. The results of the tests and related issues will be presented.

1. V.P. Yakovlev, O.A. Nezhevenko, and J.L. Hirshfield, "High Power Ferroelectric Switches at Centimeter and Millimeter Wave Lengths", Proc. 21st Particle Accelerator Conference, May 16–20, 2005, pp. 2056–2058.
2. A. Kanareykin, E. Nenasheva, A. Dedyk, and V. Yakovlev, "Ferroelectric Based Technologies for Accelerator Component Applications", Proc. 22nd Particle Accelerator Conference, June 25–29, 2007, pp. 634-636.

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